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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/729,069 | 12/04/2000 | Nicolas Nagel | GR 99 P 5374 | 6450 |

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EXAMINER

VU, DAVID

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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2818

| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE |
|--|------------|---------------|
| 3 MONTHS | 02/28/2007 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

09/729,069

Applicant(s)

NAGEL ET AL.

Examiner

DAVID VU

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 November 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4,10,12 and 14-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,10,12 and 14-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 December 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 1-2, 4, 10, 12 and 14-16 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Nishioka et al. (US 5,811,851).

Nishioka et al., in related text (col. 5, line. 30 through col. 9, line. 37) and figs. 7-8 discloses a microelectronic structure, comprising: a base substrate 30 at least partly composed of an insulating material 32 and formed with an opening; opening completely penetrating through insulating material 32; at least one conductive material 34 filling opening; at least one barrier layer 48 provided over base substrate 30, barrier layer including an oxygen-containing iridium

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layer 48 and an oxygen barrier layer 48, oxygen barrier layer being composed of one of iridium dioxide and ruthenium dioxide 48; an adhesion layer 46 disposed between base substrate 30 and at least one barrier layer 48, adhesion layer 46 containing at least one material selected from the group consisting of tantalum nitride, titanium nitride, tantalum silicide nitride and tungsten silicide (see Tables 7-8 and col. 9, lines 20-37); a noble metal layer 38 disposed on barrier layer 48; and a metal oxide-containing layer 42 disposed on a noble metal layer 38; a metal silicide layer 46 disposed on base substrate 30 directly between adhesive layer 46 and opening, causing a layer stack of silicide layer 46, adhesive layer 46 and oxygen-containing barrier layer 48 to be formed above opening.

Nishioka fails to expressly mention the adhesion layer is selected from the group consisting of titanium, zirconium, hafnium, cerium, tantalum, vanadium, chromium and niobium. It is the Examiner's position that a person having ordinary skill in the art would have found it obvious to modify Nishioka by using any suitable adhesion material and same would have been anticipated in order to produce an expected result. Furthermore, as material of the adhesion layer does seem to be critical to the invention, it must be shown that any one or all of the listed materials yield an unexpected product or result. *In re Margolis* 228 USPQ 940 (Fed. Cir. 1986); *In re Kirsch* 182 USPQ 286 (CCPA 1974); *In re Suether* 181 USPQ 36 (CCPA 1974); *In re Costello* 178 USPQ 290 (CCPA 1973); *In re Von Schickh* 150 USPQ 300 (CCPA 1966); *In re Sussman* 60 USPQ 538 (CCPA 1944); *In re Kaplan* 45 USPQ 175 (CCPA 1940). Note that the specification of the invention also teaches the adhesion layer could be formed of silicide materials as suggested by Horii.

2. Claims 1-2, 4, 10, 12 and 14-16 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Horii (US 2001/0052466).

Regarding claims 1-2, 4, 10, 12 and 14-16, Horii, in related text and fig. 1F discloses a microelectronic structure, comprising: a base substrate 12 at least partly composed of an insulating material 12 and formed with an opening; opening completely penetrating through insulating material 12; at least one conductive material 14 filling opening; at least one barrier layer 22 provided over base substrate 12, barrier layer 22 including an oxygen-containing iridium layer 22 and an oxygen barrier layer 22, oxygen barrier layer 22 being composed of one of iridium dioxide and ruthenium dioxide 22 (see [0022]); an adhesion layer 20 disposed between base substrate 10 and barrier layer 22, adhesion layer 20 containing at least one material selected from the group consisting of tantalum nitride, titanium nitride, titanium silicide nitride and tungsten silicide (see [0022]); a noble metal layer 40 disposed on barrier layer 22; and a metal oxide-containing layer 60 disposed on a noble metal layer 40; a metal silicide layer 20 disposed on base substrate 12 directly between adhesive layer 20 and opening, causing a layer stack of silicide layer 20, adhesive layer 20 and oxygen-containing barrier layer 22 to be formed above opening.

Horii fails to expressly mention the adhesion layer is selected from the group consisting of titanium, zirconium, hafnium, cerium, tantalum, vanadium, chromium and niobium. It is the Examiner's position that a person having ordinary skill in the art would have found it obvious to modify Horii by using any suitable adhesion material and same would have been anticipated in order to produce an expected result. Furthermore, as material of the adhesion layer does seem to be critical to the invention, it must be shown that any one or all of the listed materials yield an

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Response to Arguments

3. Applicant's arguments with respect to claims 1-2, 4, 10, 12 and 14-16 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be

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calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Vu whose telephone number is (571) 272-1798. The examiner can normally be reached on Monday-Friday from 8:00am to 5:00pm. If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith S can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR, Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



DAVID VU
PRIMARY EXAMINER